CLAIMS

WHAT IS CLAIMED IS:

1. A process comprising contacting chemical 1,3-propanediol with hydrogen in the presence of a hydrogenation catalyst.

2. The process of claim 1, wherein the chemical 1,3-propanediol, before the contacting has an initial color and, after the contacting, has a color that is lower than the initial color.

3. The process of claim 2, wherein the color of the 1,3-propanediol, after hydrogenation, is less than about 10 APHA.

4. The process of claim 2, wherein the color of the 1,3-propanediol, after hydrogenation, is less than about 5 APHA.

5. The process of claim 2, wherein the color of 1,3-propanediol, after hydrogenation, has a color value less than about 15 APHA when treated with 1 wt% sulfuric acid at 170 degrees C. for 10 minutes.

6. The process of claim 1, wherein the catalyst comprises at least one element of Group VIII of the Periodic Table or a metal oxide.

7. The process of claim 6 wherein the hydrogenation catalyst is supported on a support comprised of at least one of carbon, alumina, silica, titania, silica-alumina, silica-titania, titania-alumina, clays, aluminosilicates, water insoluble salts of calcium, barium, barium sulfate, calcium carbonate, strontium carbonate, and compounds and combinations thereof.

8. The process of claim 1, wherein the catalyst comprises at least one of RANEY nickel and RANEY cobalt catalyst which is optionally modified with at least one of iron, molybdenum, chromium, palladium, zinc or other modifying elements, or catalysts made as dispersions of these elements, or supported catalysts from the group consisting of palladium on carbon, palladium on calcium carbonate, palladium on barium sulfate, palladium on alumina, palladium on titania, platinum on carbon, platinum on alumina, platinum on silica, iridium on silica, iridium on carbon, iridium on alumina, rhodium on carbon, rhodium on silica, rhodium on alumina, nickel on carbon, nickel on alumina, nickel on silica, rhenium on carbon, rhenium on silica, rhenium on alumina, ruthenium on carbon, ruthenium on alumina, ruthenium on silica, mixed copper oxide, zinc oxides, and chromium oxides.

9. The process of claim 1, wherein the contacting is conducted at a temperature of about 25° - 250°C.

10. The process of claim 8, wherein the contacting is conducted at a temperature of about 80° - 130°C.

11. The process of claim 9, wherein the contacting is conducted at a temperature of about 100° - 120°C.

12. The process of claim 9, wherein the LHSV is at greater than about 0.01 h^{-1}.

13. The process of claim 12, wherein the LHSV is greater than about 1.0 h^{-1}.

14. The process of claim 13, wherein the LHSV is greater than about 10 h^{-1}.

15. The process of claim 12, wherein the contacting is conducted at a pressure of about ambient to about 1000 psig (7000 kPa).

16. The process of claim 15, wherein the contacting is conducted at a pressure of about 200 - 600 psig (1480-2860 kPa).

17. The process of claim 16, wherein the contacting is conducted at a pressure of about 300 – 500 psig.

18. The process of claim 15, wherein the amount of hydrogen contacted with the 1,3-propanediol is about 0.05 - 100 standard cm^3 per gram of 1,3-propanediol.

19. The process of claim 18, wherein the amount of hydrogen is about 0.5 - 2 standard cm^3 per gram of 1,3-propanediol.

20. The process of claim 19, wherein the amount of hydrogen is about 0.5 – 1 standard cm^3 per gram of 1,3-propanediol.

21. The process of claim 2, wherein the UV absorption of the 1,3-propanediol is reduced by at least about 50%.

22. The process of claim 2, wherein the UV absorption of the 1,3-propanediol is reduced by at least about 60%.

23. The process of claim 2, wherein the UV absorption of the 1,3-propanediol is reduced by at least about 70%.

24. The process of claim 2, wherein the UV absorption of the 1,3-propanediol, after hydrogenation, at 270 nm is less than about 0.02.

25. The process of claim 2, wherein the UV absorption of the 1,3-propanediol, after hydrogenation, at 270 nm is less than about 0.002.

26. The process of claim 1, wherein the hydrogenated 1,3-propanediol is contacted with a suitable catalyst to produce polyether diol.

27. The process of claim 1, wherein the hydrogenated 1,3-propanediol is contacted with a suitable catalyst to produce polyester diol.

28. A composition comprising: (i) 1,3-propanediol having color and (ii) hydrogenation catalyst, wherein the 1,3-propanediol has an APHA color of less than about 10.

29. The composition of claim 28, wherein the 1,3-propanediol has an APHA color of less than about 5.

30. The composition of claim 28, wherein the catalyst comprises an element of Group VIII of the Periodic Table or a metal oxide.

31. The composition of claim 30, wherein the catalyst is supported by at least one of carbon, alumina, silica, silica-alumina, silica-titania, titania, titania-alumina, barium sulfate, calcium carbonate, strontium carbonate, compounds thereof, and combinations thereof.

32. The composition of claim 31, wherein the catalyst is at least one of RANEY nickel and RANEY cobalt catalysts which is optionally modified with iron, molybdenum, chromium, palladium, zinc or other modifying elements, or catalysts made as dispersions of these elements, or supported catalysts from the group consisting of palladium on carbon, palladium on calcium carbonate, palladium on barium sulfate, palladium on alumina, palladium on titania, platinum on carbon, platinum on alumina, platinum on silica, iridium on silica, iridium on carbon, iridium on alumina,

rhodium on carbon, rhodium on silica, rhodium on alumina, nickel on carbon, nickel on alumina, nickel on silica, rhenium on carbon, rhenium on silica, rhenium on alumina, ruthenium on carbon, ruthenium on alumina, ruthenium on silica, mixed copper oxide, zinc oxides, and chromium oxides.

33. The composition of claim 28, containing about 2% - 20% catalyst.